UCLouvain

PHYS2M

2024 - 2025

PHYS2M - Teaching profile

Learning outcomes

Observe and understand the physical reality of the world around him.her, understand it, explain it and model it, these are the

7.4 Adapt the presentation to the level of expertise of the interlocutors.

7.5 Use a variety of media and computer tools to communicate (explain, write, publish) concepts and physical results.

7.6 Discuss with colleagues from other disciplines.

8. If he.she chooses the research training, actively address a research theme.

8.1 Achieve a level of expertise in a chosen field of contemporary physics.

8.2 Deepen a subject beyond current knowledge.

9. If he.she chooses the specialized focus on medical physics, practice the profession of physicist in the hospital environment.

9.1 Identify and apply the imaging and treatment techniques specific to physicists in the hospital environment.

9.2 Intervene in a clinical setting.

9.3 Undertake basic and clinical research.

10. If he.she chooses the teaching focus, mobilize the necessary skills to effectively start the profession of teacher in physics in high schools, and be able to evolve positively there.

10.1. Intervene in school context, in partnership with different actors.

10.2. Teach in authentic and varied situations.

10.3. Exercise a reflexive glance and to project him.her.self in a logic of continuous development.

Programme structure

The programme leading to the Master's [120] degree in physics includes a core curriculum, which consists of :

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				Year 1	2
⊠ LSC2001	Introduction to contemporary philosophy	Peter Verdée Peter Verdée (compensates Charles Pence)	FR [q2] [30h] [2 Credits]	x	x
⊠ LSC2220	Philosophy of science	Alexandre Guay	EN [q2] [30h] [2 Credits]	x	x
⊠ LFILO2003E	Ethics in the Sciences and technics (sem)	Alexandre Guay (compensates Charles Pence) Hervé Jeanmart René Rezsohazy	FR [q2] [15h+15h] [2 Credits]	x	x
⊠ LTHEO2840	Science and Christian faith	Benoît Bourgine [illegible] Jorge Dos tos Rodrigues	FR [q1] [15h] [2 Credits]	x	x

⊠ Formation facultative

These credits are not counted within the 120 required credits.

⊠ LSST1001	IngénieuxSud	Stéphanie Merle Jean-Pierre Raskin	FR [q1+q2] [15h+45h] [5 Credits]		

LIST OF FOCUSES

> Research Focus *[en-prog-2024-phys2m-lphys200a]*
> Teaching Focus *[en-prog-2024-phys2m-lphys200d]*
> Professional Focus : Medical Physics *[en-prog-2024-phys2m-lphys200s]*

RESEARCH FOCUS [30.0]

- Mandatory
- Optional
- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
- Offered in 2024-2025 but not the following year
- Not offered in 2024-2025 or the following year
- Activity with requisites
- Open to incoming exchange students
- Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year
1 2

Content:

Physique statistique et mathématique

LPHYS2211	Group theory	Philippe Ruelle	[EN] [q2] [22.5h+22.5h] [5 Credits] *> French-friendly*	x	

Year
1 2

TEACHING FOCUS [30.0]

IMPORTANT NOTE: In accordance with article 138 para. 4 of the decree of 7 November 2013 concerning higher education and the academic organisation of studies, teaching practice placements will not be assessed in the September session. Students are required to

Year
1 2

Module animer un groupe et travailler en équipe

Comprendre l'adolescent en situation scolaire, gérer la relation interpersonnelle et animer le groupe classe (4 credits)

Choisir 1 des activités suivantes.

⊠ LAGRE2020P	Comprendre l'adolescent en situation scolaire, Gérer la relation interpersonnelle et animer le groupe classe.		FR [q2] [22.5h+22.5h] [4 Credits]		x
⊠ LAGRE2020Q	Comprendre l'adolescent en situation scolaire, Gérer la relation interpersonnelle et animer le groupe classe.		FR [q2] [22.5h+22.5h] [4 Credits]		x

PROFESSIONAL FOCUS : MEDICAL PHYSICS [30.0]

Les étudiants ayant choisi cette finalité doivent obligatoirement avoir choisi les cours PHY 2130, PHY 2236 et PHY 2340 parmi les cours de base et les cours au choix. Ils suivront aussi tous les cours repris ci-dessous.

- Mandatory
- Optional
- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
- Offered in 2024-2025 but not the following year
- Not offered in 2024-2025 or the following year
- Activity with requisites
- Open to incoming exchange students
- Not open to incoming exchange students

[FR]

	Year 1	Year 2
⛒ Physique de la Terre, des planètes et du climat		
⛒ LENVI2005	Climate change: impacts and solutions	

				Year 1	2
⊠ LGBIO1111	Cell biology and physiology	Charles De Smet Laurent Jacques Pascal Kienlen-Campard	FR [q2] [30h+15h] [5 Credits]	x	x
⊠ LGBIO1112	Introduction to biomedical engineering	Benoit Delhaye (compensates Philippe Lefèvre) Sophie Demoustier (compensates Philippe Lefèvre) Greet Kerckhofs (compensates Philippe Lefèvre)	FR [q2] [45h] [5 Credits]	x	x

⊠ Optional courses :

These credits are not counted within the 120 required credits.

⊠ LSST1001	IngénieuxSud	Stéphanie Merle Jean-Pierre Raskin	FR [q1+q2] [15h+45h] [5 Credits]	x	x
⊠ LSST1002M	Information and critical thinking - MOOC	Anne Bauwens (compensates Jean-François Rees) Myriam De Kesel	FR [q2] [30h+15h] [3 Credits]	x	x

Alternatives

> Master [120] in Physics [professional focus of Medical Physics : UCLouvain-KULeuven] *[https://uclouvain.be/en-prog-2024-phys2m-programme]*

MASTER [120] IN PHYSICS [PROFESSIONAL FOCUS OF MEDICAL

These additional teaching units (maximum 60 credits) will be selected in the programme of the second and third annual units of the Bachelor's degree in physics, in consultation with the Study advisor, depending on the previous teaching units followed by the student and his.her training project, and will be submitted to the approval of the School of Physics.

- Mandatory
- Optional
- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
- Offered in 2024-2025 but not the following year

PHYS2M - Information

Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

General and specific admission requirements for this programme must be satisfied at the time of enrolling at the university.

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

Specific access requirements

Since this program is taught in English, no prior proof of French language proficiency is required, except for students wishing to access the didactic program who must provide proof of a CEFR level C1 proficiency.

Students who wish to be admitted on the basis of a dossier (see tables below) are invited to consult the criteria for the evaluation of application.

		authorisation from the faculty/ school.
Others Bachelors of the French speaking Community of Belgium		
		Direct access
Bachelier en sciences de l'ingénieur, orientation ingénieur civil		Access based on application
Bachelors of the Dutch speaking Community of Belgium		
		Direct access
Foreign Bachelors		
		Access based on application

Non university Bachelors

> Find out more about link [] 0 dP.r .472 0 l 119.972 0.5 l 0.5 0.5 l h W n 0.9608 0.8706 0.702 RG [] 0 d 1 w 0 0 m 120.472 0 19. Lc7i41 0 T /F1 8 Tf0 9.

Specific professional rules

Successful completion of the master's course with **teaching focus** leads to the award of the master's degree with teaching focus and the title of secondary school education specialist.

The Réforme des Titres et Fonctions ("Titles and Functions Reform"), in force since 1 September 2016, is intended to harmonise the titles, functions and pay scales of basic and secondary education professionals in French Community of Belgium networks.

It also aims to guarantee the priority of preferred titles over minimum titles and to establish a regime for titles in short supply.

AESS holders can learn which functions they can carry out and the pay scales from which they can benefit by clicking here.

The university cannot be held responsible for any problems that students may encounter at a later date with a view to a teaching appointment in the French Community of Belgium.

Teaching method

Most teaching units are given by default in English.

Various teaching methods are used : lectures, flipped classroom, project-based learning, etc. Exercise and practical lab sessions are organized for certain teaching units. Individual or group projects are planned for most of the teaching units. These projects play a significant role (around 20%) in the final grade.

Almost all teaching units have a website on the MoodleUCL platform. Useful information is provided, as well as syllabi and other documents essential to student's work.

The Master's thesis is a formative activity that must lead students to demonstrate their ability to (1) deal in depth with a physical problem in all its real complexity, by conducting a personal research, under the direction of a promoter, and (2) write a summary of his.her work and defend it in public in a rigorous and educational way, while being able to answer relatively specific questions. The various stages are : constitution of a relevant bibliography on the subject, reading and understanding of the selected articles, implementation and execution of the project, analysis and interpretation of the results obtained, writing of a synthesis manuscript and oral presentation of the latter. To carry out this project, the student is embedded in a research group with which he.she can interact.

A "thesis tutorial" introduces the student to scientific communication and, in particular, to the oral presentation of a scientific subject in English.

The physics seminar is composed of three series of presentations to which students must attend : lectures of general interest, more specific seminars dealing with physics research carried out in UCLouvain research institutes and testimonials from former students on their professional background.

Evaluation

The evaluation methods comply with the regulations concerning studies and exams. More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

The evaluation methods are in accordance with the regulations for studies and examinations. More details on the terms and conditions specific to each teaching unit are available in their fact sheet under the heading "Assessment of student achievement".

The student is evaluated on the basis of the personal work that he.she will have accomplished (readings, consultation of databases and bibliographical references1099 Tm [(Themnce ET q im ii 70rEbdnce ET q im ii 70rEbdnce ET q8er the u, prcm eferences1099 Tm [(Themnce EFions a

Possible trainings at the end of the programme

Whatever the focus chosen, the Master’s [120] degree gives direct access to the PhD in Science.

In addition, there are two particularly adapted programmes that allow for further study and obtaining specific diplomas :

1) An additional year of study at Mol, after the Master's [120] degree, allows to follow the English-speaking interuniversity programme giving the title of "Master in Nuclear Engineering" managed by BNEN (Belgian Nuclear Higher Education Network) (intensive courses are given in English by professors from different Belgian universities at the Mol Nuclear Research Center).

2) For students who have completed and passed a Master's [120] degree with specialized focus on medical physics, an expert's license in radiotherapy, medical radiophysics or radiology may be obtained by carrying out a 1-yr internship after the Master [120]. This internship also includes some additional teaching units required by the Federal Agency for Nuclear Control. These teaching units provide additional training in the following areas :

- principles, techniques and quality control in medical imaging ;
- special radiological protection issues and supplements ;
- radiochemistry, radiotoxicology and radiopharmacy ;
- assessment of the risks of radioactive releases into the environment in normal and accidental situations, and emergency plan for nuclear risks.